Dougherty Valley HS AP Chemistry
Acid Base – Study Questions Reactions of Acids and Bases

WORKSHEET #9

Name: **Date:** **Period:** **Seat #:**

Show all work for each question, box your final answer

[1] Calculate the equilibrium constant, Kneut for the neutralization of hydrocyanic acid by ammonia: 0.72

$$\mathbf{HCN(aq) + NH_3(aq) \Leftrightarrow NH_4^+(aq) + CN^-(aq)}$$

K_a for hydrocyanic acid = 4.0×10^{-10} at 25°C, K_b for ammonia = 1.8×10^{-5} at 25°C

[2] If exactly 50 mL of a 0.050M solution of hydrochloric acid is added to exactly 50 mL of 0.050M ammonia, what is the pH of the resulting solution? 5.43

[5a] What is the pH of 100 mL of pure water at 25° C? 7.0

[b] What would the pH of this 100 mL water sample be if 0.10 mL of 12M HCl was added to it? (Assume the volume doesn't change). 1.92

[c] Calculate the pH of a buffer solution composed of 0.20M ammonia and 0.20M ammonium chloride. 9.26

[d] Calculate the pH of 100 mL of this buffer solution if 0.10mL of 12M hydrochloric acid is added to it. (Assume the volume doesn't change). $1.8E^{9}$

[6] A solution contains KH_2PO_4 and K_2HPO_4 and has a pH of 7.10. What is the mole ratio of K_2HPO_4 to KH_2PO_4? 0.776:1